

POWER STORAGE DEVICE

Examiner: K. Han SN: 10/597,518 Art Unit: 1727 August 30, 2011

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 8, 2010 has been entered. Claim 1 was amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

3. The drawings were received on February 8, 2010. These drawings are acceptable. The objection to the drawings have been withdrawn in view of the replacement drawings.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the placement of the anode and cathode, does not reasonably provide enablement for preventing a short circuit. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to form the power storage device of the invention commensurate in scope with these claims. The description within the specification does not provide how the direct contact between the anode and cathode would not exhibit a short circuit to the device as would be expected to one of ordinary skill. One of ordinary skill in the art at the time of the invention further recognizes that a liquid electrolyte provides for the conduction of ions and current between half cells produce a short circuit without a separator and the respective electrodes in direct contact. Therefore, it is readily recognized a separator is required to provide for the conduction of ions without electron transfer to form the half cells required to generate an electro-motive force which connects the electrodes to an external circuit to allow for the electrons to flow and be used by an external device. For the purposes of examination it will be assumed the applicant is using a solid electrolyte forgoing the use of a separator.

Claims dependant are also rejected for the same.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear and indefinite as to the type of power storage device (e.g. battery, capacitor) which comprises the polymer as claimed for the cathode which dictates the states in which the electrodes store charge. For the purposes of examination it will be assumed the power storage device is a secondary electrochemical cell.

Regarding claim 3, it is unclear and indefinite as to whether the "aluminum electrode" is an electrode as stated in the limitations or is only describing a component of the collector. For the purposes of examination it will be assumed to be a component of the collector.

Claims dependant are also rejected for the same.

Claim Rejections - 35 USC § 102

8. Claims 1 and 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakahara et al. (JP 2002-304996, machine translation).

Regarding claim 1, Nakahara is directed towards an electric storage device (power storage device) comprising a nitroxyl polymer which has a nitroxyl cation partial structure and a nitroxyl radical partial structure [Abstract, 0008-0009] in a cathode. Nakahara further discloses using lithium as the anode active material [0045] and the use of a solid polymer electrolyte including a electrolysis solution (solvent) and

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electrolyte salt [0048] made into a gel without the use of a separator (the cathode in direct contact with the anode) [0050].

Regarding claims 3 and 4, Nakahara discloses the collector to be comprised of various materials including a carbon raw material and aluminum [0046].

Regarding claim 5, Nakahara discloses the cyclic nitroxyl structure [0010].

Regarding claim 6, Nakahara discloses the nitroxyl polymer compound having a side chain containing a residue which removes at least one hydrogen atom bonded to an element forming at least one cyclic nitroxyl structure [0017-0022].

Claim Rejections - 35 USC § 103

9. Claim 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al. as applied to claim 1 above and further in view of McManis et al. (US 4632889) is maintained.

Regarding claim 2, the teachings of Nakahara as discussed above are herein incorporated.

McManis teaches a lithium alloy composite for battery applications including lithium-aluminum and lithium-silicon alloys for the benefit of forming an anode which discharges at high rates in a variety of electrolytes (1:44-57). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an anode including active materials comprised of lithium-silicon alloy because McManis teaches it forms an anode for a battery with high discharge rates in a variety of electrolytes.

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10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al. as applied to claim 1 above and further in view of Inoue et al. (US 6090506).

Regarding claim 3, Nakahara discloses the collector to be comprised of various materials including a carbon raw material and aluminum [0046].

Inoue teaches a current collector for a battery composed of materials which undergo no chemical change within the battery including aluminum with carbon treated on the surface (13:32-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a current collector for a battery comprised of aluminum with carbon because Inoue teaches these materials undergo no chemical change within the battery and is electrically conductive.

11. Claim 3 and 4 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al. as applied to claim 1 above and further in view of Farahmandi et al. (US 5777428).

Regarding claims 3 and 4, Nakahara discloses the collector to be comprised of various materials including a carbon raw material and aluminum [0046].

Farahmandi teaches a capacitor having an aluminum impregnated with carbon electrode (including carbon paper; 5:51-52) to form a composite electrode attached to the current collector plate to form a high performance double layer capacitor (5:50-58-6:25-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an aluminum electrode impregnated with carbon in Nakahara's electric storage device because Farahmandi teaches it provides for a bipolar type double layer

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capacitor that can deliver large amounts of useful energy at a very high power output and power density rating (5:21-24).

12. Claim 3 and 4 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al. as applied to claim 1 above and further in view of Nanjundiah et al. (US 6627252).

Regarding claims 3 and 4, Nakahara discloses the collector to be comprised of various materials including a carbon raw material and aluminum [0046].

Nanjundiah teaches an electrode structure for a capacitor which is provided with a collector plate (108, 112) comprising aluminum foil with a primary coating of carbon powder film in contact with the collector plate (4:14-28) before applying the secondary electrode coating because this structure provides lower resistance (4:41-44; 6:55-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the collector of Nakahara to coated with a primary layer of carbon powder film on a aluminum foil layer because Nanjundiah teaches an electrode storage device provided with a collector having a primary layer of carbon powder provides for lower resistance in the final electrode structure.

Response to Arguments

13. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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